

Syllabus

Phil 305/505: Mathematical Logic

Fall 2017

version 1.0

Professor:

Richard Grandy

rgrandy@rice.edu (email), x2720 (direct phone), x4994 (secretary)

Office Hours: TBD, and by appointment (Humanities 203)

Teaching Assistant:

Joshua Reagan

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Review Sessions: TBD (Humanities 227)

Exam Review Sessions: TBD

Course Time and Location:

MWF: 10:00am–10:50am

Location: TBD

Course Goals:

Students should develop an understanding of formal languages and related concepts, including logical truth, entailment and derivations. They should also develop an understanding of metalinguistic concepts such as soundness, completeness and the method of recursive proof. They should develop an appreciation of both the value and limits of formal languages for analyzing reasoning and natural languages.

Course Objectives:

Students will demonstrate on examinations the abilities to: evaluate metatheoretical statements and provide proofs or counterexamples, to construct derivations in QD, translate English sentences into QL, to recognize examples of sentences which are difficult to translate, or whose translations are controversial.

Grading:

- There will be **five** take-home **examinations** during the semester. The first will count for 16% and the rest will count 21% each.
- The **Final** is a comprehensive **optional** take-home and will count for a third of your final

grade if you choose to take it.

- All homework is **optional**, but it is very strongly recommended that you do appropriate amounts. There will be **ten graded assignments** worth 10 points each. If your cumulative grade on those assignments is greater than your lowest exam score, we will substitute the graded homework score for that exam. Write legibly on all submitted assignments.

Honor Code:

- All forms of assistance are permitted on ungraded homework. Collaborative studying is encouraged.
- You may consult notes and the text for graded homework, but all other forms of assistance are forbidden.
- No assistance of any kind is permitted on examinations—no notes, friends, internet, etc. If you have questions during an examination, please email both me and the TA.

Required Texts and Materials:

All material for the course is available free in Owlspace. The pdfs for the course textbook are in the Resources folder.

Lateness Policy:

Graded homeworks and exams are due at the beginning of the next class. Late homeworks and exams will be penalized per hour.

Absence Policy:

Attendance is not required, but students are responsible for all material covered in lecture.

Disability Policy:

Any student with a documented disability needing academic adjustments or accommodations is requested to speak with me during the first two weeks of class. All discussions will remain confidential. Students with disabilities should also contact Disability Support Services, Rm. 111 Allen Center, 713-348-5841, www.dss.rice.edu.

Note:

The specific assignments, due dates, etc may be changed if necessary due to circumstances beyond the control of the instructor. (Hurricanes happen.)

Course Schedule:

Wk	Lr	Day	Date	Topic	Note
1	1	m	Aug 21	Introduction	
	2	w	Aug 23	Syntax of SL	
	3	f	Aug 25	Truth, Models, and Logical Truth	Review Session at 12pm
2	4	m	Aug 28	Entailment	Graded HW 1 due
	5	w	Aug 30	Recursive Proof	
	6	f	Sep 1	Equivalence, Contraries and Contradictories	Review Session at 12pm
3		m	Sep 4	no class	Labor Day
		t	Sep 5		Graded HW 2 due 12 PM
	7	w	Sep 6	More Entailment and Recursive Proof	
	8	f	Sep 8	Disjunctive Normal Form	Review Session at 12pm Test Review Session TBD
4	9	m	Sep 11	Syntax of QL1 (Ch 3)	Exam 1 due
	10	w	Sep 13	Semantics of QL1 (Ch 3)	
	11	f	Sep 15	QL1 Truth, Entailment (Ch 3)	Review Session at 12pm
5	12	m	Sep 18	Equivalence, Contraries and Contradictories (Ch 3)	Graded HW 3 due
	13	w	Sep 20	Syntax of QL (Ch 4)	
	14	f	Sep 22	Semantics of QL (Ch 4)	Review Session at 12pm
6	15	m	Sep 25	QL Truth, Entailment (Ch 4)	Graded HW 4 due
	16	w	Sep 27	QL Translations (Ch 5)	
	17	f	Sep 28	More Translations (Ch 5)	Review Session at 12pm Test Review Session TBD

Course Schedule (Cont'd):

Wk	Lr	Day	Date	Topic	Note
7	18	m	Oct 2	More QL Truth	Exam 2 due
	19	w	Oct 4	Dragnet Theorem and Applications (Ch 4)	
	20	f	Oct 6	More QL Entailment, etc. (Ch 4)	Review Session at 12pm
8		m	Oct 9	no class	Midterm Recess
	21	w	Oct 11	SD Derivations/ SD ⁺ Derivations (Ch 6)	Graded HW 5 due
	22	f	Oct 13	SD ⁺ Derivations/ QD Derivations (Ch 6)	Review Session at 12pm
9	23	m	Oct 16	More Derivations (Ch 6)	Graded HW 6 due
	24	w	Oct 18	Still More Derivations (Ch 6)	
	25	f	Oct 20	Even More Derivations (than before) (Ch 6)	Review Session at 12pm Test Review Session TBD
10	26	m	Oct 23	Soundness of SD (Ch 7)	Exam 3 due
	27	w	Oct 25	Completeness of SD (Ch 7)	
	28	f	Oct 27	Many Valued Logics (Ch 8)	Review Session at 12pm
11	29	m	Oct 30	Soundness of QD, Replacement Theorem, Soundness of SD/QD ⁺ , and Prenex Normal Form (Ch 7)	Graded HW 7 due
	30	w	Nov 1	Completeness Method (Ch 7)	
	31	f	Nov 3	Completeness Models (Ch 7)	Review Session at 12pm
12	32	m	Nov 6	More Completeness (Ch 7)	Graded HW 8 due
	33	w	Nov 8	Löwenheim-Skolem Theorem and Decision Methods (Ch 7)	
	34	f	Nov 10	Review of the Method, etc (Ch 7)	Review Session at 12pm Test Review Session TBD

Course Schedule (Cont'd):

Wk	Lr	Day	Date	Topic	Note
13	35	m	Nov 13	Syntax and Semantics of Modal Logic (Ch 8)	Exam 4 due
	36	w	Nov 15	Modal Derivations (Ch 8)	
	37	f	Nov 16	Syntax of QLI, Truth and Translations (Ch 8)	Review Session at 12pm
14	38	m	Nov 20	QDI Derivations (Ch 8)	Graded HW 9 due
	39	w	Nov 22	Review of Modality and Identity (Ch 8)	
		f	Nov 24	no class	Thanksgiving
15	40	m	Nov 27	Course Review and Glimpses Beyond	Graded HW 10 due Test Review Session TBD
	41	w	Nov 29		Exam 5 due
	42	f	Dec 1	Exam 5 Returned and Preview of Optional Final	